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**ATTORNEY AT LAW**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	<b>DECLARATION OF JEFFREY Y. HONDA, PH.D.</b>
NEUMANN	)	
	)	
	)	
Serial No.:	08/871,004	)
	)	
Filing Date:	June 6, 1997	)
	)	
Attorney Docket No.:	NEU-101	)
	)	Examiner: Lavinder, J.
	)	
	)	Group Art Unit: 3616
Title:	CAPSICUM BASED	)
	INSECTICIDE	)
	AND METHOD OF USE	)
	(once amended)	)
	)	

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**DECLARATION OF JEFFREY Y. HONDA, PH.D.**

I, Jeffrey Y. Honda, do hereby declare under penalty of perjury:

1. The following is true and accurate, and that this declaration is based on my own personal knowledge and on information and belief.
2. I make this Declaration in support of Applicant Robert Neumann's Application for Letters Patent entitled CAPSICUM BASED PESTICIDE AND METHOD OF USE.
3. I am an Assistant Professor at San Jose State University in the Department of Biological

Sciences, One Washington Square, San Jose, California 95192-0100, Tel: (408) 924-4877, Fax:(408) 924-4840.

4. A true and accurate copy of my current Curriculum Vitae is attached hereto. I hold a Ph.D. degree in the field of Entomology and have over ten years of professional experience. I have taught and done research at numerous nationally and internationally accredited institutions of higher learning. I have received recognition for my academic achievements both here in the United States as well as internationally.
5. Neither I nor San Jose State University are an agent, employee, partner nor representative in any capacity of the Applicant. Neither I nor San Jose State University have any financial, pecuniary nor other interest, either vested or unvested, in the present Application. I have known only known of Mr. Neumann since about February 3, 1999 and have only known Mr. Neumann personally since about February 18, 1999.
6. On February 18, 1999 I performed a scientific study to determine whether the active ingredients in "Habanero" chile peppers (assumed to be capsicum) has the ability to kill termites. It is my conclusion that "Habanero" pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment.
7. The Objective, Methods, Results and Conclusions of my study are contained in a document which I wrote entitled "The Use of Pepper Extract as a Possible Mortality Agent against Termites" which is also attached hereto. The documents describe a study using two different species of termites, namely subterranean and drywood termites. No variations in the concentration of pepper spray were made with regard to the non-control methods.
8. Based on my experiments, I conclude that the pepper extract, at least at the tested

concentration, is significantly associated with subterranean termite mortality. There is only a 0.5% probability that my results were due to chance alone. I conclude that "Habanero" pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment.

9. Although drywood termite mortality was observed when exposed to pepper extract, the results were not statistically significant and inconclusive. I cannot state with statistical confidence that pepper extract kills drywood termites.
10. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Section 1001, and that such willful statements may jeopardize the validity of the application or any patent issued thereon.

Declarant:

\_\_\_\_\_  
Jeffrey Y. Honda, Ph.D.

Date: February 22, 1999

## CURRICULUM VITAE

**JEFFREY Y HONDA**  
3089 Teal Ridge Ct.  
San Jose, CA. 95136  
408-269-4309

---

## EDUCATION

<b>University of California</b> <i>Ph.D. in Entomology</i>	<b>Riverside, CA</b> 1995
<b>University of California</b> <i>M.S. in Entomology</i>	<b>Riverside, CA</b> 1990
<b>San Jose State University</b> <i>B.S. in Biological Sciences</i> <i>Concentration Entomology</i>	<b>San Jose, CA</b> 1987

## PROFESSIONAL EMPLOYMENT

<b>San Jose State University</b> <i>Assistant Professor</i>	<b>San Jose, CA.</b> August 1998- Present
<b>Kyushu University</b> <i>Research Fellow</i>	<b>Fukuoka, Japan</b> June 1997-June 1998
<b>San Jose State University</b> <i>Assistant Professor</i> (Temporary Faculty Assignment)	<b>San Jose, CA</b> January 1996-May 1997 January 1997-May 1997
<b>Wageningen Agricultural University</b> <i>Research Associate</i>	<b>Wageningen, The Netherlands</b> August 1995-January 1996 July 1996-January 1997
<b>University of California</b> <i>Research Associate</i>	<b>Riverside, CA</b> February 1995- August 1995
<b>University of California</b> <i>Research and Teaching Assistant</i>	<b>Riverside, CA</b> September 1988-February 1995

Jeffrey Y Honda

Page 2

**Moreno Valley Unified School District**  
*Substitute Teacher*

**Moreno Valley, CA**  
1992

**Santa Clara County Department of Food and Agriculture**  
*Inspector*

**San Jose, CA**  
1988

**Laboratory Services**  
*Assistant Laboratory Technician*

**San Jose, CA**  
1984 to 1988

**California Department of Food and Agriculture**  
*Inspector*

**Campbell, CA**  
1986

## PUBLICATIONS

### Proceedings and Unrefereed Articles:

**Vereijssen, J., I Silva, J. Honda, and Richard Stouthamer. 1997. Development of a Method to Predict the Biological Control Quality of *Trichogramma* Strains.**

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- *Entomologia Experimentalis et Applicata*. 45(5): 1-6.

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- *The Pan-Pacific Entomologist*. 71(4): 227-236.

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- *Annals of the Entomological Society of America*. 88(4): 227-236.

#### **PROFESSIONAL ORGANIZATIONS**

**Sigma Xi**

- 1991-present

**Gamma Sigma Delta**

- 1994-present

**Pan-Pacific Entomological Society**

- 1993-present

**Entomological Society of America**

- 1990-present

#### **AWARDS AND FELLOWSHIPS**

**Japan Society for the Promotion of Science**

Kyushu University, 1997

**Harry Scott Smith Award for Outstanding Biological Control Student**

University of California, Riverside. 1994

The Use of Pepper Extract as a Possible Mortality Agent against Termites  
Jeffrey Y. Honda, Ph.D.  
February 19, 1999

## Objective

To determine whether the active ingredients in 'Habenero' peppers (assumed to be capsicum) have the ability to kill termites.

## Methods

### 'Habenero' Pepper Solution

Ten medium sized 'Habenero' peppers were finely chopped and allowed to soak for three hours in 600 ml. of purified water. The solution was then filtered into a spray bottle for experiments.

### Termites

2 termite species, commonly known as drywood and subterranean termites, were collected in the field. Twenty-five drywood termites were divided into two groups: one which contained 14 termites and one which contained 11 termites. Each group of termites was placed in a 9 cm. diameter petri dish containing moistened filter paper. The first group containing 14 termites was subjected to three bursts from the spray bottle containing the pepper extract. The second group consisting of 11 drywood termites was subjected to three bursts from a spray bottle containing water only which served as a control. The same experimental design was used for subterranean termites except the treatment and control groups contained 14 and 13 termites, respectively.

Termites were maintained in their respective petri dishes for 24 hrs, after which counts were made to determine the number of termites surviving for each group.

Significant differences in survivorship were compared for each species using a  $\chi^2$  test of independence.

## Results

Data for drywood termites are shown below. Three of 14 termites were dead after 24 hrs. when exposed to pepper extract. No termites in the water control died in this period. Based on the statistics below, pepper extract does not kill drywood termites

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	11	3	14
Water control	11	0	11
Totals	22	3	25

From this data we can predict expected frequencies

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	12.3	1.7	14
Water control	9.7	1.3	11
Totals	22	3	25

The  $\chi^2$  value is calculated below\*:

$$\chi^2 = \frac{(|11-12.3| - .50)^2}{12.3} + \frac{(|13-1.7| - .50)^2}{1.7} + \frac{(|11-9.7| - .50)^2}{9.7} + \frac{(|0-1.3| - .50)^2}{1.3}$$

\*Formula, table values, and computations can be found in Biometry, by Sokal and Rolf.

$$\chi^2 = 2.97, \text{ df}=1$$

$$\chi^2 \text{ Table value} = 7.9 \text{ at } p=0.005$$

Because the obtained value (2.97) is less than the table value (7.9), we can conclude that pepper extract is not significantly associated with drywood termite mortality.

Data for subterranean termites are shown below. Thirteen of 14 termites were dead after 24 hrs. when exposed to pepper extract. No termites in the water controlled died in this period. This result is statistically significant based on the following computations:

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	1	13	14
Water control	13	0	13
Totals	14	13	27

From this data we can predict expected frequencies

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	7.3	6.7	14
Water control	6.7	6.3	13
Totals	14	13	27

The  $\chi^2$  value is calculated below:

$$\chi^2 = \frac{(|1-7.3|-50)^2}{7.3} + \frac{(|13-6.7|-50)^2}{6.7} + \frac{(|13-6.7|-50)^2}{6.7} + \frac{(|0-6.3|-50)^2}{6.3}$$

$$\chi^2 = 19.9, \text{ df}=1$$

$$\chi^2 \text{ Table value} = 7.9 \text{ at } p=0.005$$

Because the obtained value (19.9) is greater than the table value (7.9), we can conclude that pepper extract is significantly associated with subterranean termite mortality. There is only a 0.5% probability that our results were due to chance alone.

### Conclusions:

Based on this experiment it is concluded that 'Habenero' pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment. Although drywood termite mortality was observed when exposed to pepper extract, the results were not statistically significant and inconclusive. It can not be stated with statistical confidence that pepper extract kills drywood termites.

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**RAY K. SHAHANI**  
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Filing Date:	June 6, 1997	)
		)
Attorney Docket No.:	NEU-101	)
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	INSECTICIDE	)
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		Group Art Unit: 3616

Commissioner of Patents and Trademarks  
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2. I make this Declaration in support of Applicant Robert Neumann's Application for Letters Patent entitled **CAPSICUM BASED PESTICIDE AND METHOD OF USE**.
3. I am an Assistant Professor at San Jose State University in the Department of Biological

Declaration of Jeffrey Y. Honda, Ph.D.

Title: **CAPSICUM BASED INSECTICIDE AND METHOD OF USE**

Serial No.: 08/871,004

Page 1 of 3

Attorney Docket No.: NEU-101

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FROM SAN JOSE BIOLOGICAL SCI 4089244840

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2-22-1999 12:46PM

FROM LAW OFFICES 650 348 8655

P. 3

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Title: CAPSICUM BASED INSECTICIDE AND METHOD OF USE

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Page 2 of 3

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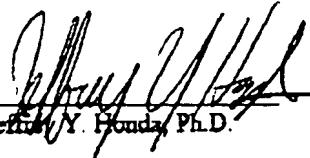
P. 4

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Declarant:

Jeffrey Y. Honda, Ph.D.



Date: February 22, 1999

2-23-1999 2:44AM

FROM S. BIOLOGICAL SCI 4089244840

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2-22-1999 12:47PM

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## CURRICULUM VITAE

**JEFFREY Y HONDA**  
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### EDUCATION

<b>University of California</b> <i>Ph.D. in Entomology</i>	<b>Riverside, CA</b> 1995
<b>University of California</b> <i>M.S. in Entomology</i>	<b>Riverside, CA</b> 1990
<b>San Jose State University</b> <i>B.S. in Biological Sciences</i> <i>Concentration Entomology</i>	<b>San Jose, CA</b> 1987

### PROFESSIONAL EMPLOYMENT

<b>San Jose State University</b> <i>Assistant Professor</i>	<b>San Jose, CA.</b> August 1998- Present
<b>Kyushu University</b> <i>Research Fellow</i>	<b>Fukuoka, Japan</b> June 1997-June 1998
<b>San Jose State University</b> <i>Assistant Professor</i> <i>(Temporary Faculty Assignment)</i>	<b>San Jose, CA</b> January 1996-May 1997 January 1997-May 1997
<b>Wageningen Agricultural University</b> <i>Research Associate</i>	<b>Wageningen, The Netherlands</b> August 1985-January 1986 July 1998-January 1997
<b>University of California</b> <i>Research Associate</i>	<b>Riverside, CA</b> February 1985- August 1995
<b>University of California</b> <i>Research and Teaching Assistant</i>	<b>Riverside, CA</b> September 1989-February 1995

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Page 2

**Moreno Valley Unified School District  
Substitute Teacher**

**Moreno Valley, CA  
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**Santa Clara County Department of Food and Agriculture  
Inspector**

**San Jose, CA  
1988**

**Laboratory Services  
Assistant Laboratory Technician**

**San Jose, CA  
1984 to 1988**

**California Department of Food and Agriculture  
Inspector**

**Campbell, CA  
1986**

## **PUBLICATIONS**

### **Proceedings and Unreferred Articles:**

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The Use of Pepper Extract as a Possible Mortality Agent against Termites

Jeffrey Y. Honda, Ph.D.

February 19, 1999

2-23-1999 2:45AM

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P. 9

### Objective

To determine whether the active ingredients in 'Habenero' peppers (assumed to be capsicum) have the ability to kill termites.

### Methods

#### 'Habenero' Pepper Solution

Ten medium sized 'Habenero' peppers were finely chopped and allowed to soak for three hours in 600 ml. of purified water. The solution was then filtered into a spray bottle for experiments.

#### Termites

2 termite species, commonly known as drywood and subterranean termites, were collected in the field. Twenty-five drywood termites were divided into two groups: one which contained 14 termites and one which contained 11 termites. Each group of termites was placed in a 9 cm. diameter petri dish containing moistened filter paper. The first group containing 14 termites was subjected to three bursts from the spray bottle containing the pepper extract. The second group consisting of 11 drywood termites was subjected to three bursts from a spray bottle containing water only which served as a control. The same experimental design was used for subterranean termites except the treatment and control groups contained 14 and 13 termites, respectively.

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Significant differences in survivorship were compared for each species using a  $\chi^2$  test of independence.

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## Results

Data for drywood termites are shown below. Three of 14 termites were dead after 24 hrs. when exposed to pepper extract. No termites in the water control died in this period. Based on the statistics below, pepper extract does not kill drywood termites.

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs.)	Totals
Pepper extract	11	3	14
Water control	11	0	11
Totals	22	3	25

From this data we can predict expected frequencies:

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs.)	Totals
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$$\chi^2 = \frac{[(11-12.3)-.50]^2}{12.3} + \frac{[(13-1.7)-.50]^2}{1.7} + \frac{[(11-9.7)-.50]^2}{9.7} + \frac{[(0-1.3)-.50]^2}{1.3}$$

\*Formula, table values, and computations can be found in Biometry, by Sokal and Rohlf.

$$\chi^2 = 2.97, df = 1$$

$$\chi^2 \text{ Table value} = 7.9 \text{ at } p=0.005$$

Because the obtained value (2.97) is less than the table value (7.9), we can conclude that pepper extract is not significantly associated with drywood termite mortality.

Data for subterranean termites are shown below. Thirteen of 14 termites were dead after 24 hrs. when exposed to pepper extract. No termites in the water control died in this period. This result is statistically significant based on the following computations:

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Totals	14	13	27

From this data we can predict expected frequencies

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs.)	Totals
Pepper extract	7.3	6.7	14
Water control	6.7	6.3	13
Totals	14	13	27

The  $\chi^2$  value is calculated below:

$$\chi^2 = \frac{(11-7.3)^2}{7.3} + \frac{(13-6.7)^2}{6.7} + \frac{(13-6.7)^2}{6.7} + \frac{(10-6.3)^2}{6.3}$$

$$\chi^2 = 19.9, df = 1$$

$\chi^2$  Table value = 7.9 at  $p=0.005$

Because the obtained value (19.9) is greater than the table value (7.9), we can conclude that pepper extract is significantly associated with subterranean termite mortality. There is only a 0.5% probability that our results were due to chance alone.

#### Conclusions:

Based on this experiment it is concluded that 'Habenero' pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment. Although drywood termite mortality was observed when exposed to pepper extract, the results were not statistically significant and inconclusive. It can not be stated with statistical confidence that pepper extract kills drywood termites.